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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Kirschstein Ottinger
Israel & Schiff Miller
489 Fifth Avenue
New York, NY 10017-6105

EXAMINER

DOUGHERTY, THOMAS M

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/019,141

Applicant(s)

SALLOWAY ET AL.

Examiner

Thomas M. Dougherty

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 34-38, 40-51 and 53-66 is/are rejected.
- 7) ☒ Claim(s) 39 and 52 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 34-38, 40, 44, 45, 48-51, 53, 55, 58-60 and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Bishop et al. (US 6,124,678). Bishop et al. show (cover page) a piezo-electric transformer circuit, comprising: a piezo-electric transformer (1A, 1B) having mutually vibrationally coupled primary (1A) and secondary (1B) regions, the secondary region being operable to provide an output signal for use in generating an output from the circuit; and vibration exciting means for exciting the transformer into vibration to generate the output signal, the transformer including a hard piezo-electric material having a dielectric loss of substantially 0.005 or less at 1 kHz frequency. Note that as Bishop et al. show a hard piezoelectric material, and the other structural features of the invention, the claimed operability of the device is regarded as being inherently met.

The exciting means is operable for exciting vibrations at a frequency corresponding to a modal resonance of the primary and secondary regions, (see figure 9).

The exciting means incorporates a network (53, 54) operable for phase shifting and amplifying the output signal to generate a drive signal for exciting and thereby sustaining vibrations within the transformer.

The network is operable for phase shifting the output signal in a range of 30° to 150° to generate the drive signal.

The network is operable for phase shifting the output signal in a range of 30° to 90° to generate the drive signal. See discussion of the phase adjustment features of the drive circuit at col. 15 line 63 to col. 16, line 6.

The exciting means is operable for exciting vibrations and incorporates at least one inductor (L1) through which the transformer is driven at its primary region, the inductor (L1) being operable for electrically resonating with a capacitor (in 54) provided by the primary region at a frequency corresponding to that of the vibrations.

The transformer is operable for imparting a greater voltage amplitude to the output signal relative to that of the drive signal. Note that as the claimed structural features are shown by the reference, this feature, which is regarded as a goal of the invention, is inherently met by the reference.

The transformer is operable for vibrating in a longitudinal mode of acoustic resonance. See for example, col. 9, ll. 31-39.

The methodology of using the piezo-electric transformer includes extracting signals from the secondary region of the transformer through an inductor (note L!1 is part of the output circuit) arranged to electrically resonate with a capacitor (parasitic) provided by the secondary region at a frequency corresponding to that of the vibrations.

Note that how the device is used, e.g. in a personnel-wearable apparatus does not carry patentable weight since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 41 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bishop et al. (US 6,124,678). Given the invention of Bishop et al. as noted above, it is unknown whether their one inductor incorporates a ferrite core. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ an inductor with a ferrite core in the invention of Bishop et al. at the time of their invention, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claim 42, 43, 56 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bishop et al. (US 6,124,678) in view of Bishop et al. (US 6,114,797). Given the first invention of Bishop et al. noted above, they do not show any rectification.

The second Bishop et al. reference shows rectifying means (77) for rectifying the output signal from the secondary region (1B) to provide the output from the circuit, the output being in form of a unipolar output potential.

The second Bishop et al. reference don't note a hard material for both driver and generator sections.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a rectifier at the output of the transformer in the first noted invention of Bishop et al. at the time of their invention, in order to provided both a stable output and to be able to provide a load with a necessary input voltage. Note that rectifiers typically consist of diode arrangements thus such a common construction carries no patentable weight.

Claims 46, 47, 61, 62 and 64-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bishop et al. (US 6,124,678) in view of Hall et al. (US 5,872,419). Given the first invention of Bishop et al. noted above he doesn't explicitly show a stack of mutually joined piezo-electric material elements. Hall et al. show (e.g. fig. 1) show a piezo-electric transformer circuit, comprising: a piezo-electric transformer (100) having mutually vibrationally coupled primary (106) and secondary (108) regions, the secondary region (108) being operable to provide an output signal for use in generating an output from the circuit; and vibration exciting means (oscillator) for exciting the transformer (100) into vibration to generate the output signal.

The primary region (106) of the transformer (100) comprises a stack of mutually joined piezo-electric material elements, each element incorporating electrical connections and arranged to be excited in parallel with other of the elements.

The transformer incorporates in a range of 2 to 40 elements in the primary region (determined by sight), and a single element (108) in the secondary region.

Hall et al. don't disclose a transformer including a hard piezo-electric material having a dielectric loss of substantially 0.005 or less at 1 kHz frequency.

It would have been obvious to one having ordinary skill in the art to employ a hard piezo-electric material having a dielectric loss of substantially 0.005 or less at 1 kHz frequency in the device of Hall et al. at the time their invention was made in order to take advantage since such material does not depole very easily and will have a high Q value as Bishop et al. note at col. 17, lines 54-65.

Note that how the device is used, e.g. in a personnel-wearable apparatus does not carry patentable weight since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Allowable Subject Matter

Claims 39 and 52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or fairly suggest an exciting means that incorporates amplifiers arranged in a bridge configuration operable for driving the transformer.

Direct inquiry concerning this action to Examiner Dougherty at (703) 308-1628.

tmd
tmd

March 13, 2003

Thomas M. Dougherty
THOMAS M. DOUGHERTY
PRIMARY EXAMINER
GROUP 1800
2800